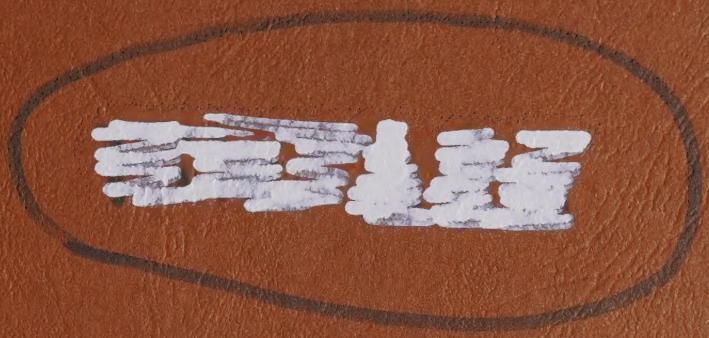

MODEL 1250A

CRYSTAL FREQUENCY STANDARD

OPERATION AND MAINTENANCE MANUAL

AUSTRON

AUSTRON INC. 1915 KRAMER LANE, AUSTIN, TEXAS 78758 (512) 836-3523 TWX 910/874-1356

MODEL 1250A

CRYSTAL FREQUENCY STANDARD

OPERATION AND MAINTENANCE MANUAL

FEBRUARY, 1979

P/N 12797317

WARRANTY

AUSTRON, Inc., of Austin, Texas, warrants, for one year after delivery, to the original purchaser of any product manufactured by AUSTRON, that same shall be free of defects in material and workmanship. Obligation under this warranty shall be limited to repair or replacement, at AUSTRON's discretion, of any product or part thereof which has been returned by the original purchaser with transportation prepaid, and upon examination by AUSTRON, is found to be defective. AUSTRON assumes no responsibility for loss or damage to equipment being returned for repair or replacement under the terms of this warranty.

For this warranty to be effective, the purchaser agrees that the equipment will be properly installed and maintained. Equipment which, upon examination by AUSTRON, requires repair or replacement of parts thereof as a result of improper installation, misuse, unauthorized alterations or repairs, or user negligence, such repairs or replacement of parts thereof will be made at cost.

AUSTRON makes no representation or warranty of any kind, either expressed or implied, with respect to equipment operation and procedures. Any action that the user may take in reliance upon the operation or accuracy of this equipment shall be taken solely upon the user's own responsibility and risk.

AUSTRON shall not be liable for consequential damages to purchaser, user, or any others resulting from the possession or use of this equipment.

Prior to return of a product under terms of this warranty, AUSTRON, Inc., Austin, Texas, is to be notified. Notification is to include the Model Number and Serial Number of the product and full details of the problem.

AUSTRON MODEL 1250A FREQUENCY STANDARD

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AUSTRON MODEL 1250A FREQUENCY STANDARD

1.0 GENERAL DESCRIPTION

1.1 SCOPE OF SECTION

1.1.1 This section introduces the AUSTRON Model 1250A Frequency Standard. Provided here are descriptions of the equipment, its purpose, specifications, operating controls and indicators. (See Figure 1-1.)

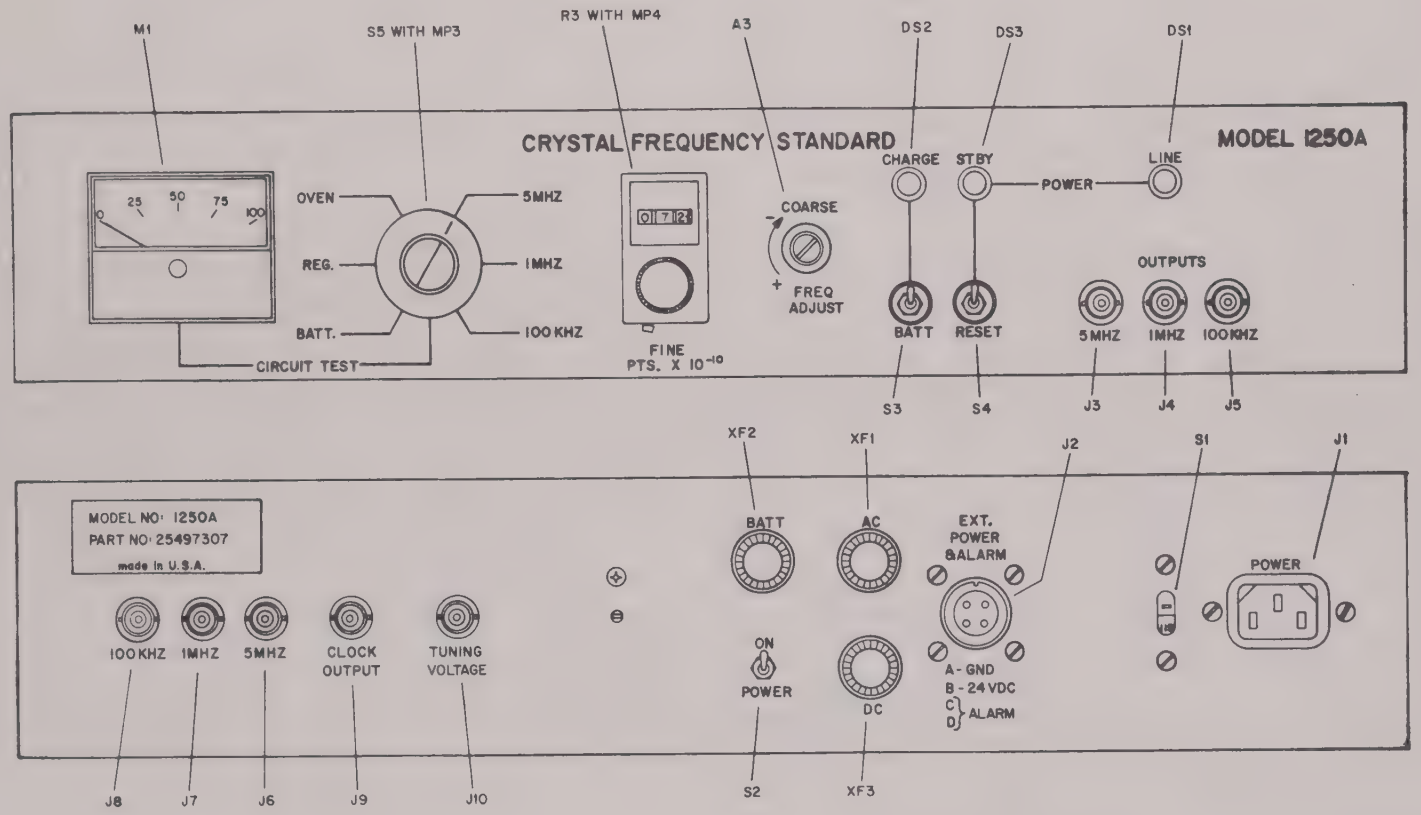
1.2 PURPOSE OF EQUIPMENT

1.2.1 The AUSTRON Model 1250A Frequency Standard is designed to perform as a secondary standard. As such, it generates high-stability output frequencies at 5 MHz, 1 MHz, and 100 kHz. The AUSTRON Model 1250A employs a high-quality, high temperature bake-out crystal unit which, together with special oscillator circuitry, is mounted in a proportional oven. A high stability feedback amplifier is used in connection with an automatic gain control (AGC) system to maintain the crystal drive power at the low constant value that is necessary to attain high frequency stability.

1.2.2 The AUSTRON Model 1250A operates from an ac source of 115/230 VAC or 17-35 VDC. Also incorporated is an internal battery pack which allows the oscillator to operate for ten hours, should primary power fail.

1.2.3 The AUSTRON Model 1250A utilizes high quality silicon semiconductors. Other component parts have been chosen for reliability and long life. In order to facilitate servicing, the 1250A has been designed for easy access to all important components.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	—		1-17-77	



127 973 -	12504	1A1	1
NEXT ASSY	USED ON	REF DES	FIG NO

APPLICATION

TOLERANCES
UNLESS OTHERWISE SPECIFIED

DECIMALS	FRACTIONS	ANGLES

MATERIAL:

ENGR	[illegible]	1-19-77
CHECK		
DRFTSMN	BARKER	10-8-76

AUSTRON INC.
AUSTIN, TEXAS

FRONT AND REAR PANELS
MODEL 1250A

SIZE	CODE IDENT NO	
3	24672	124 97327

SCALE 1:1 SHEET OF

1.3 SPECIFICATIONS OF EQUIPMENT

1.3.1 The AUSTRON Model 1250A Frequency Standard consists of an AUSTRON Model 1150 Crystal Oscillator, dividers and output amplifiers which are powered by a supply (which has a voltage regulator and standby batteries). The following paragraphs provide specific information on the Model 1250A.

1.3.1.1 Physical Specifications

Height	3 1/2 inches
Width	17 inches (19 with furnished rack mount adaptors)
Depth	11 5/8 inches behind the rack panel, 13 3/4 inches overall.
Weight	20 pounds 12 ounces
Output Terminals	5, 1 MHz and 100 kHz front and rear BNC type. Clock and external electrical tuning...rear BNC type.

1.3.1.2 Electrical Specifications

Input Voltage	115/230 V $\pm$ 10%, 48-420 Hz 17-35 VDC negative ground 12 W maximum.
Standby	Internal Nicad battery pack provides 10 hours of standby power at +25°C.
Battery Recharge	14 to 16 hours.

1.3.1.3 Operating Specifications

Output Frequency	5 MHz, 1 MHz, 100 kHz and 1 MHz clock drive sinusoidal.
Output Voltage	$\geq$ 1 RMS into 50 ohms, clock drive $\geq$ 0.5 V RMS into 1 kohms.
Alarm Output	Contact closure on primary failure. Contacts rated 5a,120 VAC.
Frequency Adjustments	
Fine Adjustments	$\geq 90 \times 10^{-9}$ with digital dial having 5000 divisions.
Coarse Adjustment	$\geq 300 \times 10^{-9}$
External Adjustment	$\geq 5 \times 10^{-8}$ with +5 to -5 VDC applied.
Stability	
Long Term	$\leq 5 \times 10^{-10}$ after 24 hours, 1×10^{-10}/day after 30 days continuous operation. Ultimate drift is typically 5×10^{-11}/day after 90 days.
Medium Term	$\leq 1 \times 10^{-11}$ RMS for a 120 sec. averaging time.
Short Term	$\leq 5 \times 10^{-12}$ RMS for a 1 sec. averaging time.
Retrace	$\leq 1 \times 10^{-9}$ after 2 hours warm-up following a 24 hour off-time.
Ambient	$\leq \pm 2 \times 10^{-9}$ from -10°C to +50°C.
Load	$\leq \pm 1 \times 10^{-11}$ for open, 50 ohm load.

1.3.1.3 Operating Specifications (Cont'd.)

Supply	$\leq \pm 5 \times 10^{-11}$ for 17 to 35 VDC or 115/230V AC ± 10%.
Harmonic Distortion	5 MHz, 1 MHz, 100 kHz down more than 40 dB from rated output.
Non-Harmonically Related Outputs	5 MHz, 1 MHz, 100 kHz down more than 80 dB from rated output.
Storage Temperature	-55°C to +75°C w/o batteries, -40°C to +50°C w/batteries.
Operating Temperature	-40°C to +50°C (batteries cannot be recharged below -17°C).
Humidity	0 to 95%.

1.4 SAFETY PRECAUTIONS

1.4.1 WARNING: 115/230 VAC IS EXPOSED ON THE INSIDE OF THE REAR PANEL.

1.4.2 WARNING: DO NOT SHORT NICAD BATTERIES; HIGH CURRENTS ARE AVAILABLE WHICH WILL DAMAGE TOOLS, WIRING, AND BATTERIES.

1.4.3 CAUTION: BATTERIES SHOULD BE REMOVED PRIOR TO STORAGE OR SHIPMENT IN EXCESS OF THIRTY DAYS OR STORAGE TEMPERATURES GREATER THAN -40°C TO +50°C.

1.4.4 CAUTION: THE AUSTRON 1150 OSCILLATOR IS A SEALED UNIT AND AS SUCH IS NOT REPAIRABLE. ANY ATTEMPT TO OPEN THIS UNIT VOIDS THE WARRANTY. SEND TO FACTORY FOR REPAIR OR REPLACEMENT.

1.5 CONTROLS, INDICATORS AND CONNECTORS

1.5.1 Figure 1-1 shows all panel controls, indicators, and connectors for the Model 1250A. Specific information is provided in the following paragraphs.

1.5.1.1 Front Panel

REFERENCE	DESCRIPTION	FUNCTION
M1	Circuit test meter	Displays relative operation of circuit selected by circuit test switch.
S5	Circuit test switch	Selects battery voltage, regulated voltage, oven current, 5 MHz amp drive, 1 MHz amp drive, 100 kHz amp drive on a relative scale.
R3	Fine Frequency Adjustment	A 5000 division dial which read frequency in parts X 10^{-10} the range is approximately 000.0 X 10^{-10} to 999.9 X 10^{-10}.
A3	Coarse Frequency Adjustment	Removal of the seal screw allows access to the adjustment capacitor which has a total range of $\geq$ 300 X 10^{-9}. (Use AUSTRON tool number 02096081.)
S3	Battery Charge Switch	In the down position the internal batteries are on trickle charge and in the up position on high charge.

1.5.1.1 Front Panel (Cont'd.)

REFERENCE	DESCRIPTION	FUNCTION
DS2	Battery Charge Lamp	Is lighted when the internal batteries are on high charge.
S4	Standby Reset Switch	A two function momentary switch which extinguishes the standby lamp after ac power has returned and will allow the operator to start the standard on the interval battery pack. (NOT RECOMMENDED FOR COLD STARTS.)
DS3	Standby Lamp	Indicates that the primary ac has failed at some time.
DS1	Line Lamp	Indicates the presence of primary ac.
J3	BNC 5 MHz	5 MHz output port.
J4	BNC 1 MHz	1 MHz output port.
J5	BNC 100 kHz	100 kHz output port.

1.5.1.2 Rear Panel

REFERENCE	DESCRIPTION	FUNCTION
J6	BNC 5 MHz	5 MHz output port.
J7	BNC 1 MHz	1 MHz output port.

1.5.1.2 Rear Panel (Cont'd.)

REFERENCE	DESCRIPTION	FUNCTION
J8	BNC 100 kHz	100 kHz output port.
J9	BNC Clock Output	A 1 MHz sine at $\geq$ 0.5 V RMS into 1 kohm.
J10	BNC Tuning Voltage	An input port which will accept a dc voltage in the range of $\pm$ 5 VDC to adjust the frequency a total of $\geq 5 \times 10^{-8}$.
XF2	Battery Fuse	A 1 amp Slo-Blo fuse which protects the battery pack.
XF1	AC Fuse	A 1 amp Slo-Blo fuse which protects the power transformer.
XF3	DC Fuse	A 1 amp standard fuse which protects the voltage regulator.
S2	Power Switch	A 3PDT switch which connects ac, ext. dc and internal batteries to the standard.
J2	Ext. Power and Alarm	A MS connector which will accept + 17-35 VDC pin A negative ground and pin B positive dc input, pins C and D provide a contact closure (5a 120 VAC rating) when primary ac fails.

1.5.1.2 Rear Panel (Cont'd.)

REFERENCE	DESCRIPTION	FUNCTION
S1	115/230 Switch	Select 115 V or 230 VAC operation.
J1	Power Connector	Input port for primary ac.

2.0 INSTALLATION

2.1 SCOPE OF SECTION

2.1.1 This section describes the steps required to prepare the Model 1250A Frequency Standard for operation or reshipment to another location. Included in this section are instructions for unpacking, inspection, and shipping, along with lists of fundamental electrical requirements and accessories.

2.2 UNPACKING AND INSPECTION

2.2.1 Initial Inspection -- Immediately report any equipment damage to the carrier making delivery and to AUSTRON, Inc. Inspect internal components and circuit by removing the dust covers. Examine exterior and interior parts carefully.

2.2.2 Circuit Boards -- Exercise care when removing or installing circuits boards. The recommended installation procedure is to align the board contacts with the connector then carefully insert the board as far as it will go.

NOTE: COMPONENT SIDE TO THE RIGHT WHEN FACING THE FRONT PANEL.

CAUTION: TURN POWER OFF BEFORE REMOVING OR INSTALLING BOARDS.

Save all packing material for reshipment where practical.

2.3 OPERATIONAL INSTALLATION

2.3.1 Accessories -- The following accessories should be received with the Model 1250A:

a) One three conductor power cord for 115V operation.
b) One mating dc and alarm connector.
c) One cable clamp for MS type connector.
d) Two sets of spare fuses.
e) Two technical manuals.
f) One PCB extender card.
g) One tuning wand.

2.3.2 Power Connections -- This unit operates on 115V ac or 230V ac ± 10%, 48-420 Hz. Before connecting the power cable to the source verify that switch 1A1S1 is in the correct (115 or 230) position and that 1A1F1 is 1 amp SLO-BLO 3 AG for 115V or 0.5 amp SLO-BLO for 230V.

2.3.3 Cable Connections -- With the MS type connector supplied, fabricate a cable to supply the dc standby power. The connections are as follows:

	PIN	
	A	GND
SUPPLY		
	B	+ 17---35VDC
	C	Contact Closure
ALARM		
	D	Rated at 5a 120VAC

2.3.4 Installation -- The Model 1250A may be rack mounted in a standard 19 inch rack or bench mounted on a stable surface, as required. Choose a location away from components producing high temperatures.

2.4 PREPARATION FOR RESHIPMENT

2.4.1 Turn off power. Check to see that mounted components are in place and secure.

CAUTION: IF SHIPMENT OR STORAGE DURATION OF GREATER THAN 30 DAYS OR STORAGE TEMPERATURES GREATER THAN -40°C to +50°C IS ANTICIPATED THE NICAD BATTERIES SHOULD BE REMOVED BY A QUALIFIED TECHNICIAN. SEE PARAGRAPH 1.4.

2.4.2 For shipping, use the original packing material, if possible. If not, enclose the unit in a suitable water and vapor proof transparent plastic bag. Projections and sharp edges should be padded with cushioning material. Heat seal or tape the plastic bag to ensure a moistureproof enclosure. When sealing the bag, keep the trapped air volume to a practical minimum.

2.4.3 Place the unit in an interior box of such dimensions that will not allow movement. Place the interior box in a shipping container of such dimensions that will allow for at least two inches of rubberized hair or similar material on all sides of the interior box.

3.0 OPERATION INSTRUCTIONS

3.1 SCOPE OF SECTION

3.1.1 This section provides instructions for operating the AUSTRON Model 1250A Frequency Standard. Included are general descriptions of set-up, check out, and adjustment.

3.2 SET-UP AND TURN-ON PROCEDURE

3.2.1 After installation as per paragraph 2.3 place the power switch lever (1A1S2) in the ON position (up).

3.2.2 Check the circuit test monitor and verify the following:

a) BATT between 40 and 60.
b) REG between 40 and 60.
c) OVEN less than 10 (oven cold).
d) 5 MHz between 40 and 60.
e) 1 MHz between 40 and 60.
f) 100 kHz between 40 and 60.

3.2.3 Check the battery charge switch (1A1S3) by placing the lever in the up position. Note that the charge lamp (1A1DS2) should light and battery-voltage indicator should move up scale slightly. Place the battery charge switch in the down position.

3.2.4 Disconnect the ac power cord (1A1W1). Note that the standby lamp (1A1DS3) is on and that pins C and D on the external power and alarm connector (1A1J2) read zero ohms. Reconnect the ac power cord and note that C and D are now open.

3.2.4 (Cont'd.)
The line lamp (1A1DS1) should be on. Place the standby reset switch (1A1S4) in the down position and release; note that the standby lamp (1A1DS3) turns off.

3.2.5 Check the battery power-up circuit in the following manner, when the unit under test has a charged (may be partially charged) internal battery pack. Remove the ac power and the external dc power. Place the power switch in the OFF position (down). Place the power switch in the ON position (up). Set the circuit test switch (1A1S5) to the REG position. Place the standby reset switch (1A1S4) in the DOWN position and release. The regulated voltage should be present on the meter (1A1M1). Reconnect the ac and dc power.

3.2.6 Verify the output at the 5 MHz, 1 MHz, and 100 kHz ports are present and at least 1 V RMS into 50 ohms load. Also check the clock output for 1 MHz 0.5 V RMS into a 1 kohm load.

3.2.7 At this time, allow six hours for the 1250A to stablize.

CAUTION: DO NOT MAKE ANY FREQUENCY ADJUSTMENTS DURING THIS TIME.

3.2.8 Check the circuit test monitor in the OVEN position and verify that it reads between 40 and 60. Record the values of all the monitor positions at this time and save as an indicator of proper operation for future reference.

3.2.9 After stablization, the frequency may be corrected with the fine frequency control (1A1R3), by comparing the output to a reference source with a phase comparator (AUSTRON Model 1201A) or a frequency meter (see Figure 3-1).

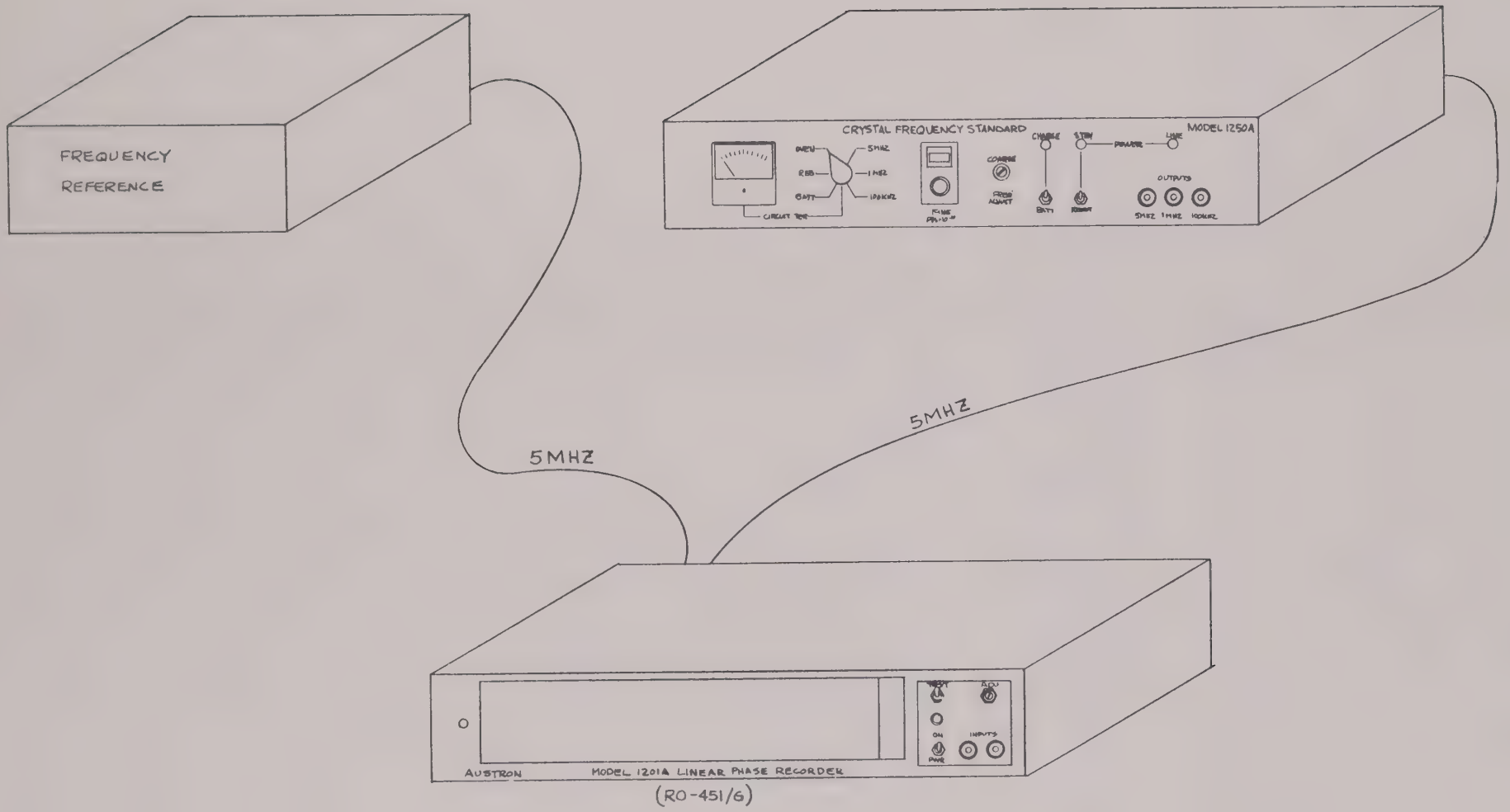

FREQUENCY
REFERENCE
CRYSTAL FREQUENCY STANDARD
MODEL 1250A
5MHZ
1MHZ
100KHZ
OUTPUTS
5MHZ
5MHZ
AUSTRON
MODEL 1201A LINEAR PHASE RECORDER
(RO-451/6)

FIG 3-1

3.2.10 When corrections can no longer be made with the fine frequency control, return the control to 750 on the dial and remove the coarse tuning access screw. With the tool provided (02096081), engage the tuning capacitor and set the oscillator on frequency. Remove the tool and replace the access screw. Allow 15 minutes for the oven to stabilize. Make the final frequency correction with the fine frequency control.

3.2.11 External frequency adjustment may be made in the following manner. Set the fine frequency control on the front panel to 750 when using $\pm$ 5 VDC applied to the tuning voltage input port (1A1J10) on the rear panel.

3.2.12 Other input voltages up to + 20 V, may be used as long as the algebraic sum of the input voltage and the fine tuning dial reading, read in volts (0.00 V to 9.99 V), is greater than zero. Because of the non-linearity of various voltage/dial combinations it is advisable to calculate frequency vs. voltage curves to determine the gain constant for various servo loop applications.

3.2.13 Batteries should be charged for 16 hours after they have been depleted to the point that the cut-out circuit (on A2) has disconnected them.

4.0 FUNCTIONAL DESCRIPTION

4.1 SCOPE OF SECTION

4.1.1 This section provides a functional analysis of the Model 1250A Frequency Standard, through the use of circuit descriptions and schematics for each circuit board.

4.2 POWER SUPPLY (A2)

4.2.1 The 1250A power supply is designed to perform several functions, such as automatic battery switch-over, automatic external dc switch-over, automatic low voltage battery cut-out, ac interruption indication, and electrical tuning.

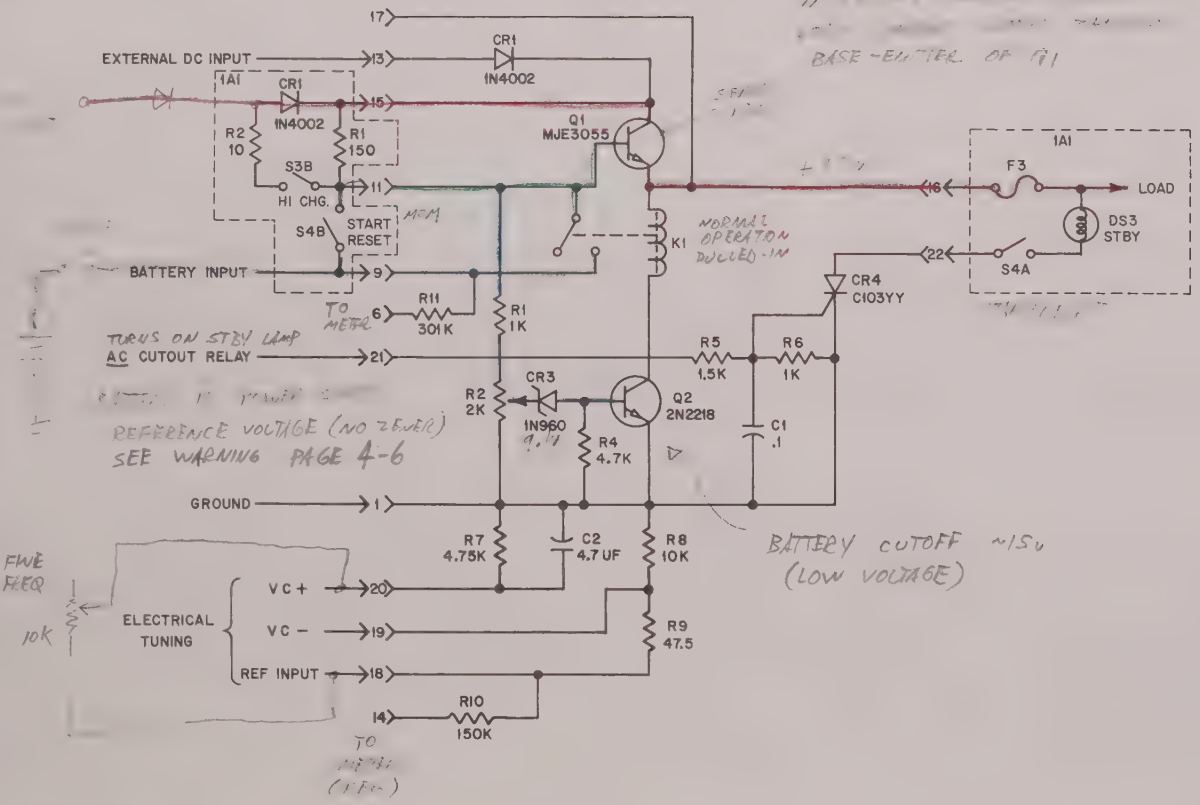
4.2.2 Diode CR1 is used as an external dc switch, when back biased by the bridge input the external dc is cut off. The transistor Q1 is used as a series regulator to supply the load. The reference voltage for Q1 is supplied by the batteries through relay K1, which is held closed by Q2 whose bias is furnished by CR3 which along with resistors R1, R2, and R3 detect the battery voltage.

4.2.3 The gate of the SCR CR3 is fired by the ac cut-out relay, this lights the standby lamp until the reset is depressed.

4.2.4 Components C2, R7, R8, and R9 form a linearizing circuit for the oscillator varicap.

4.2.5 Resistors R10 and R11 are used for voltage monitoring.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	D	RELEASED TO ORIGINAL STANDARDS PER ECO 1799	1-6-77	RAB
	E	IN AREA 1A1 R1 WAS 200Ω, R2 WAS 20Ω. DELETED CR2 MOVED R1D TO CONNECT WITH PIN 18 ECO. 2466	10-11-78	RAB



BASE-EMITTER OF Q1

1. UNLESS OTHERWISE SPECIFIED ALL RESISTORS ARE 1/4W, 10% WITH VALUES IN OHMS & ALL CAPACITANCE VALUES ARE IN MICROFARADS.

NOTES:

NEXT ASSY	USED ON	REF DES	FIG NO
103 95533	1250B	1A1A2	4-1
103 95533	1220S	1A1A2	4-1
103 95533	1250A	1A1A2	4-1

APPLICATION

TOLERANCES UNLESS OTHERWISE SPECIFIED
DECIMALS | FRACTIONS | ANGLES

MATERIAL:

ENGR	[illegible]	1-19-77
CHECK	[illegible]	1-19-77
DRFTSMN	[illegible]	1-19-77

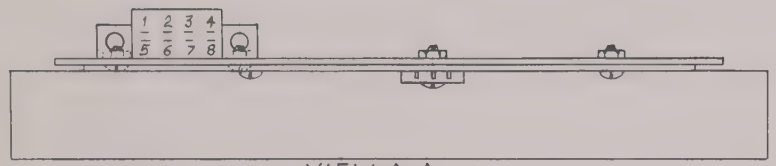
AUSTRON INC.
AUSTIN, TEXAS

SCHEMATIC - POWER SUPPLY

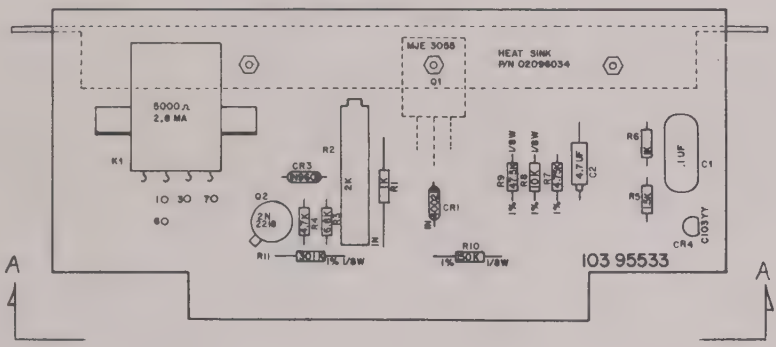
SIZE	CODE IDENT NO		
3	24672	123 96100	E

SCALE | S. | OF

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	REVISED & REDRAWN PER ECO 1180	1-12-76	RDB
	B	REMOVE Q3 PER ECO 1221	1-26-76	RDB
	C	ECO 1370: Q2 WAS 2N5189	5/19/76	RDB
	D	ECO 1403: ADDED REF DES; R11 WAS 300K, R9 WAS 47K; R7 WAS 4.7	5/7/76	RDB
	E	REVISED P/L PER ECO 2361	5-3-78	RDB
	F	REMOVED CR2 PER ECO. 2466	10-11-78	RJB
	G	REVISED P/L PER ECO 2661	1-16-79	RDB



VIEW A-A



QTY REQD	ITEM NO	REF DES	PART NO	NOMENCLATURE	VENDOR
-1			LIST OF MATERIAL		
			254 96649	1250B	4-2
			254 96460	1220S	
			254 97307*	1250A	4-2
			254 95205*	1250	

NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

ENGINEER	Kaf	2-27-76
CHECKED	RDB	2-18-76
DRAFTSMAN	J Wiley	1-12-76

AUSTRON INC AUSTIN TEXAS

PC BOARD ASSY., POWER SUPPLY

SIZE	CODE IDENT NO		
2	24672	103 95533	G
SCALE		SHEET	OF

1. RUN #22 BUS WIRE WITH TEF TUBING FROM NUMBERED PINS OF RELAY TO CORRESPONDING NUMBERS ON BOARD (PINS 1,3,6,7 ONLY)

NOTES:

4.3 AUSTRON MODEL 1150 OSCILLATOR (A3)

4.3.1 The AUSTRON Model 1150 Oscillator employs a high-quality, high temperature bake-out crystal unit which, together with special oscillator circuitry, is mounted in a proportional oven. A high stability feedback amplifier is used in connection with an automatic gain control (AGC) system to maintain the crystal drive power at the low constant value that is necessary to attain high frequency stability.

4.3.2 The Model 1150 Oscillator is a sealed unit and as such is not field repairable. Any attempt to open this unit voids the warranty. Send to the factory for repair or replacement.

4.4 SINE CONVERTER (A4)

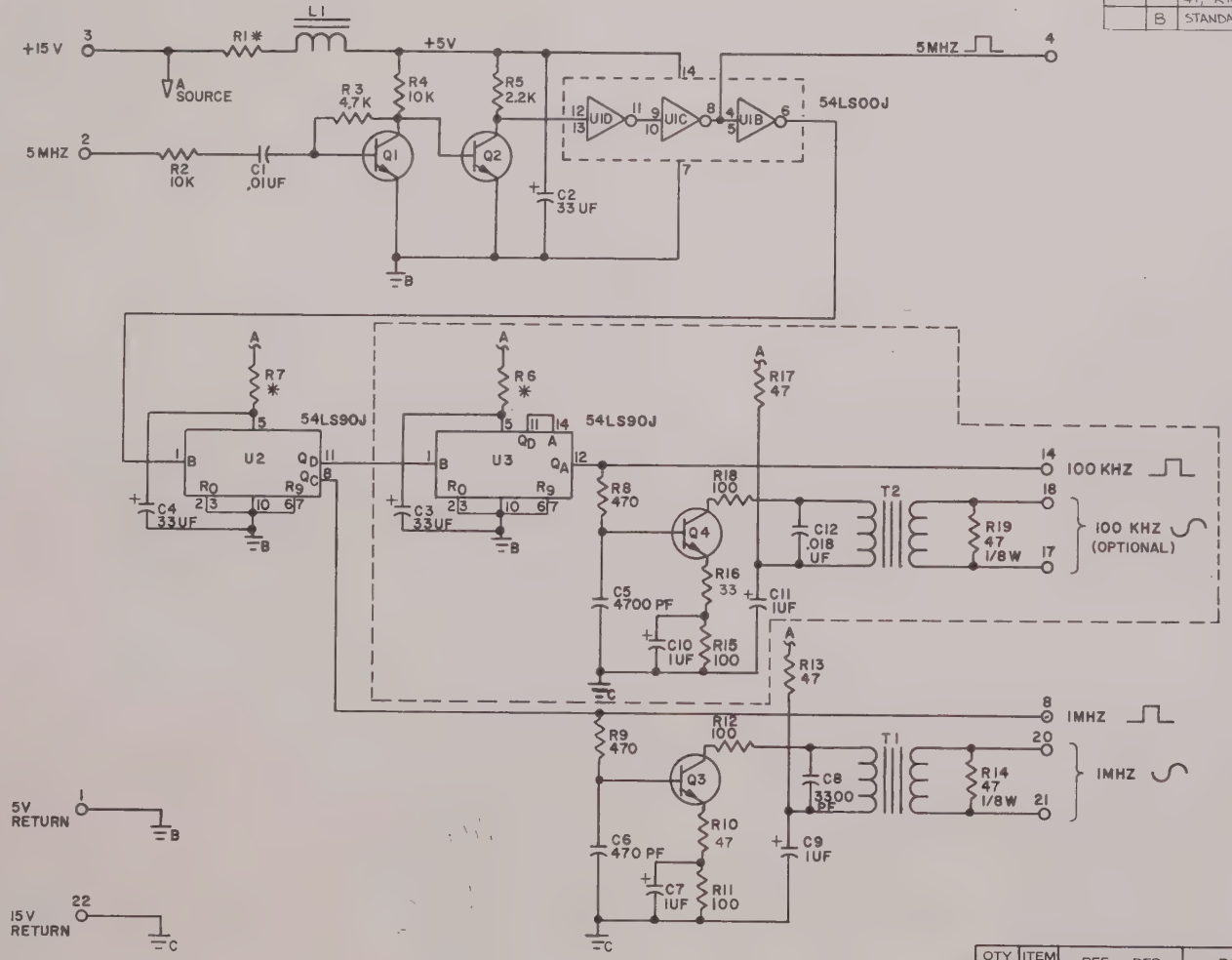
4.4.1 The sine converter card contains a 5 MHz clipper, 5 MHz buffer gate, a divide by 5 stage, a decade divider and two sine converter buffer amplifiers.

4.4.2 The 5 MHz sinewave from the internal oscillator is supplied through isolating resistor R2 and coupling capacitor C1 to the input of a two-stage direct coupled amplifier made up of Q1 and Q2. The output of this amplifier is a 5 MHz pulse which has the proper characteristics to drive U1B, U1C, U1D, which comprise a 5 MHz buffer gate. The output of U1C is a 5 MHz TTL signal which is supplied to U2.

4.4.3 U2 is a divide by five stage which produces a 1 MHz TTL output from the 5 MHz TTL input. The 1 MHz TTL output from U2 is fed through a low pass filter R9, C6, to the base of a collector tuned RF amplifier. The resulting 1 MHz sinewave at the secondary of T1 is used to drive the 1 MHz output buffer.

4.4.4 U3 is a decade divider which produces a 100 kHz TTL output from a 1 MHz TTL input supplied from U2. The 100 kHz TTL signal is fed through a low pass filter R8 and C5 to the base of Q4, a collector-tuned output amplifier. The 100 kHz signal present at the secondary of T2 is used to drive the 100 kHz output buffer.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	RELEASED	10-9-75	RDB
	A	ADDED DASHED LINE TO 100KHZ SECTION; R16 WAS 47; R10 WAS 33 PER ECO 1460	5-18-76	RDB
	B	STANDARDIZED ON 54LS00 J'S PER ECO. 2058, 2087	9-23-77	RDB



NOTES:
1 * R1, R6, AND R7 ARE SELECTED TO PROVIDE 5V TO THE RESPECTIVE IC.
2 ALL RESISTORS ARE 1/4 W 10% UNLESS NOTED.
3 ALL TRANSISTORS 2N 3904
4 IC'S ARE SELECTED FOR AMBIENT TEMPERATURE REQUIREMENT OF THE UNIT.

QTY REQD	ITEM NO	REF DES	PART NO	NOMENCLATURE	VENDOR
-1				LIST OF MATERIAL	

1A1A4	4-3	127 97317	1250A
A18	4-12	103 96025	1210 D
REF DES	FIG NO	NEXT ASSY	USED ON
APPLICATION			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWINGS

TOLERANCES UNLESS OTHERWISE SPECIFIED

DECIMALS	FRACTIONS	ANGLES

MATERIAL:

ENGINEER	L.R.J.	10-7-75
CHECKED	R.D.B.	10-9-75
DRAFTSMAN	Jim Wiley	

AUSTRON INC. AUSTIN, TEXAS

SCHEMATIC DIAGRAM
SINE CONVERTER

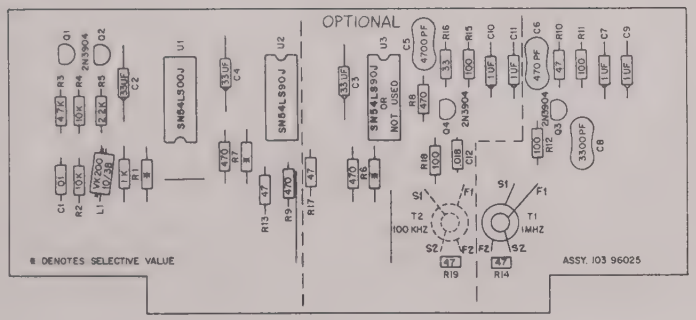
SIZE	CODE IDENT NO.		
3	24672	123 96096	B

SCALE NONE

1 OF 1

ASSEMBLY VARIATIONS		
PART NUMBER	U3	T2
* 103 96025	SN54LS90J	AS SHOWN
* 103 96025-1	NOT USED	NOT USED

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	RELEASED	10-7-75	RDB
	A	REVISED TO ADD "-1" PER ECO #1191	12-31-75	RDB
	B	ADDED DASH LINES & "OPTIONAL" PER ECO 1459	5-18-76	RDB
	C	ADDED S&F DESIGNATORS TO T1 & T2 PER ECO 1856	3-16-77	RDB
	D	STANDARDIZED ON 5400 J'S PER ECO. 2058, 2087	9-23-77	RDB
	E	CORRECTED TYPE NO. OF U2 & U3 PER ECO 2234	2-13-78	RDB



QTY REQD	ITEM NO	REF DES	PART NO	NOMENCLATURE	VENDOR
-1			LIST OF MATERIAL		
A18			271 96208-1	1210D-01	
1A1A4	4-4		254 95205 *	1250A	
A18	4-13		271 96208	1210D	
REF DES	FIG NO		NEXT ASSY	USED ON	
APPLICATION					

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWING
TOLERANCES UNLESS OTHERWISE SPECIFIED
DEC FRACT ANG
MATERIAL:

ENGINEER	RDB	10-9-75
CHECKED	RDB	10-9-75
DRAFTSMAN	BARKER	10-7-75

AUSTRON INC AUSTIN TEXAS

P C BOARD ASSY - SINE CONVERTER

SIZE 2 | CODE IDENT NO 24672 | 103 96025 * | E

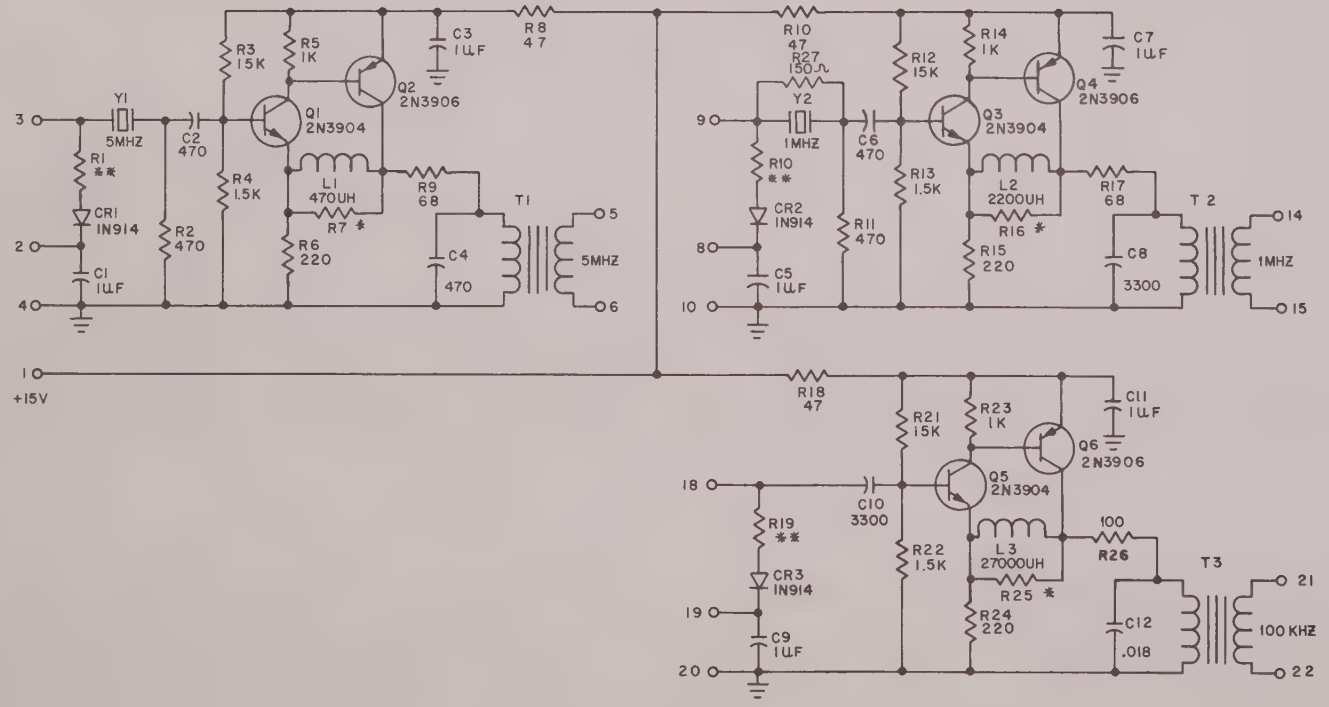
SCALE 1:1 | SHEET 1 OF 1

4.5 OUTPUT AMPLIFIERS

4.5.1 The output amplifier card contains three similar amplifiers which operate in a like manner. For example, we will discuss the 5 MHz amplifier.

4.5.2 Components R1, CR1, and C1 form a monitoring circuit to check the input to the amplifier. Crystal Y1 in an input filter with R2 as its load. The transistors Q1 and Q2 form a two-stage common emitter, collector-tuned amplifier with negative feedback. The feedback ratio is determined by R7 and R6. These amplifiers have been designed to allow a minimum level change for a maximum load change.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	—	RELEASED	1-3-77	RAB



2. ** SELECT FOR MID-SCALE ON M1.
1. * SELECT FOR OUTPUT LEVEL 1V RMS INTO 50 OHMS.
NOTES:

NEXT ASSY	USED ON	REF DES	FIG NO
103 96986	1250A	1A1A5	4-5
103 96986	1250		

APPLICATION

TOLERANCES UNLESS OTHERWISE SPECIFIED
DECIMALS | FRACTIONS | ANGLES

MATERIAL:

ENGR		2-17-76
CHECK		2/15/76
DRFTSMN	BARKER	10-7-76

AUSTRON INC.
AUSTIN, TEXAS

SCHEMATIC DIAGRAM -
OUTPUT AMPLIFIER

SIZE	CODE IDENT NO	
3	24672	123 97320

SCALE

OF

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	–	RELEASED	3-23-76	RDB
	A	REVISED PICTURE TO AGREE WITH SCREEN CHANGES PER ECO # 1432	5-12-76	
	B	ECO 1518: C10 WAS 470; ADDED 150Ω RES ACROSS Y2	8-23-76	
	C	ECO 2210: IDENTIFIED WINDINGS ON T1, T2, & T3; ADDED VALUES TO Y1 & Y2	2-13-78	RDB

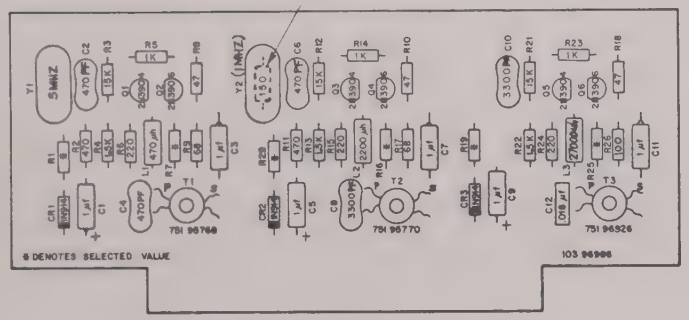


FIG 4-6

QTY REQD	ITEM NO	REF DES	PART NO	NOMENCLATURE	VENDOR
-1		LIST OF MATERIAL			

25497307 *	1250A
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWING

TOLERANCES UNLESS OTHERWISE SPECIFIED

DEC	FRACT	ANG

MATERIAL:

ENGINEER		
CHECKED	RDB	3-23-76
DRAFTSMAN	BARKER	3-17-76

AUSTRON INC AUSTIN TEXAS

PC BOARD ASSY. – OUTPUT AMPLIFIER

SIZE	CODE IDENT NO		
2	24672	103 96986	C

SCALE 1:1 SHEET OF

4.6 CHASSIS FUNCTIONS (A1)

4.6.1 The Model 1250A chassis performs several functions, such as: battery pack mounting, high and low charge, unregulated dc supply, and oscillator decoupling.

4.6.2 The internal Nicad battery pack is mounted to the inside rear support member. These batteries have a four amp-hour capacity which will power the Model 1250A for ten hours at +25°C. The batteries are the reference for the voltage regulator (A2);

WARNING: DO NOT OPERATE UNIT WITH THE BATTERIES REMOVED.

The low charge current for the batteries is through 1A1R1 and the high charge current through 1A1R1 and R2 connected in parallel by switch 1A1S3B. (See warning paragraph 1.4.2.)

4.6.3 The unregulated dc supply is composed of 1A1T1, 1A1C1, and bridge 1A1A1. The input is selected by 1A1S1 for 115V or 230V ac.

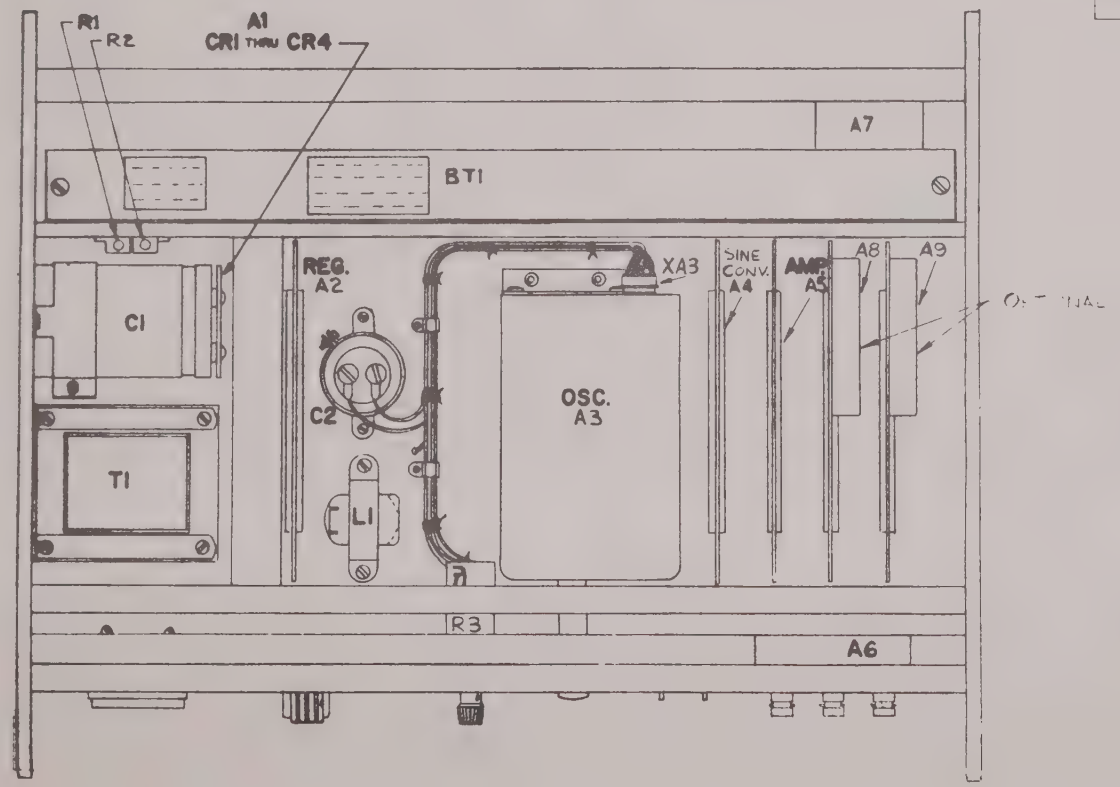
4.6.4 Choke 1A1L1 and capacitor 1A1C1 form a decoupling network of the 1150 Oscillator (A3).

4.6.5 The relay 1A1K1 performs the alarm function; when the primary ac fails, it also fires the standby lamp circuit located on (A2).

4.7 OUTPUT FILTER (A6 and A7)

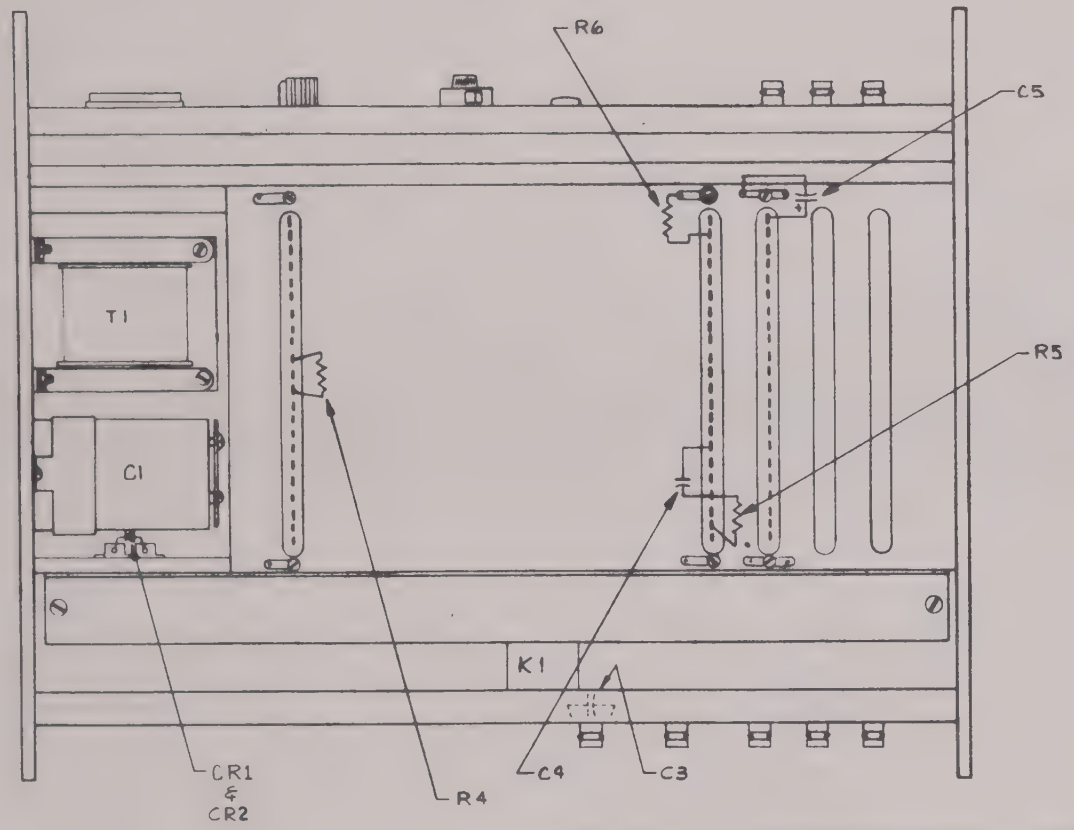
4.7.1 The output filters (of which there are two) have three LC filters which are tuned at 5 MHz, 1 MHz, and 100 kHz. These filters are mounted on the output BNC connectors on both the front and rear panels.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
		[illegible]	[illegible]	



				TOLERANCES UNLESS OTHERWISE SPECIFIED			AUSTRON INC AUSTIN TEXAS	
				DEC	FRAC	ANG	TOP VIEW, MODEL 1250 A	
				MATERIAL:				
127 97317	1250 A	1A1	4-7	ENGR	[illegible]	1-12-77	SIZE 2	CODE IDENT NO 24672	124 97325
NEXT ASSY	USED ON	REF DES	FIG NO	CHECK				
APPLICATION				DRFTMN	KW16	9/8/76	SCALE NONE	SHEET 1 OF 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	—	RELEASED	1-19-77	RDB



127 97317	1250 A	1A1	4-8
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED
DEC | FRAC | ANG

MATERIAL:

ENGR	[illegible]	1-19-77
CHECK		
DRFTMN	KWIG	9/8/76

AUSTRON INC
AUSTIN, TEXAS

BOTTOM VIEW
MODEL 1250 A

SIZE	CODE IDENT NO	
2	24672	124 97326

SCALE NONE | SHEET 1 OF 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		RELEASED	1-19-77	RDH
	A	R1 WAS 220Ω R2 WAS 20Ω PER ECO. #2467	9-1-78	RLB

XA2 PS

XA4 CONV

XA5 AMP

OSC.

XA3

DC OUTPUT

DC OUTPUT

L1 TM1514

C2 1500 uf

C5 4.7 uf 35V

RG

5MHZ

1MHZ

100KHZ

R2 10Ω

R1 150Ω

S3B

S4B

CR1 1N4002

F3 1A

CR2 MR850

TP-1

A1

CR1 CR2 CR3 CR4

C1 6500 uf

S2B

BT1

FZ 1A

DS3

S4A

K1

DS2

S3A

DS1

TM2208 T1

S2C

115 S1 230

S2A

F1 1A

J1

115/230 VAC

R3 10K

R4 8.45K 1%

C3 .01

S5 BATT REG OVEN 5MHZ 1MHZ 100KHZ

M1

J10 TUNING VOLTAGE

R5 825Ω 1%

C4 .01

J9 CLOCK OUTPUT

A6 L1 L2 L3 C1 220 PF C2 1000 PF C3 .01 uf

A7 L1 L2 L3 C1 220 PF C2 1000 PF C3 .01 uf

J3 J4 J5 J6 J7 J8

FRONT REAR

CONTACT CLOSURE FOR EXT. ALARM

EXT DC INPUT 17-35 VDC

USE EXT IN-LINE FUSE

J2

QTY REQD	ITEM NO	REF DES	PART NO	NOMENCLATURE	VENDOR
-1				LIST OF MATERIAL	

1A1	4-9	12797317	1250A
REF DES	FIG NO	NEXT ASSY	USED ON
APPLICATION			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWINGS
TOLERANCES UNLESS OTHERWISE SPECIFIED
DECIMALS | FRACTIONS | ANGLES
MATERIAL

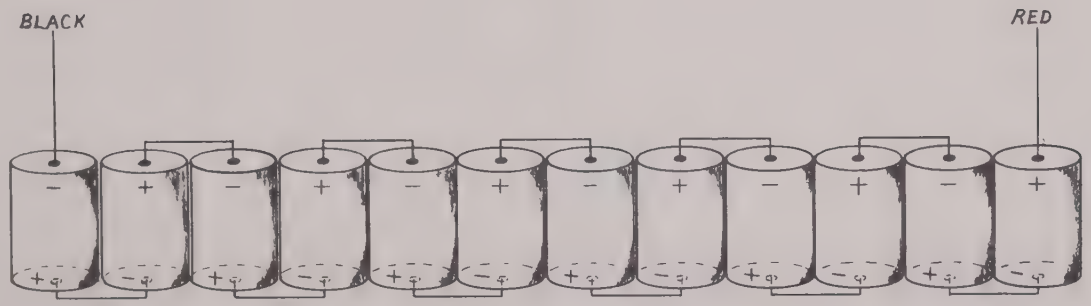
ENGINEER	RDH	1-19-77
CHECKED	RJB	12-28-76
DRAFTSMAN	WILEY	10-8-76

AUSTRON INC AUSTIN, TEXAS

SCHEMATIC, INTERCONNECT BOARD

SIZE	CODE IDENT NO.		
4	24672	12397328	A
SCALE		SHEET OF	

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	–	RELEASED	12-17-76	RDB



QTY REQD	ITEM NO	REF DES	PART NO	NOMENCLATURE	VENDOR
-1				LIST OF MATERIAL	

NOTES:
1. USE 24 AWG WIRE

4-8	204 96650	1250 B
4-5	204 96660	1220S
4-10	204 97308	1250A
FIG. NO.	NEXT ASSY	USED ON
	APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWING

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DEC | FRACT | ANG

MATERIAL:

ENGINEER	RBL	12-17-76
CHECKED		
DRAFTSMAN	J. Wiley	11-5-75

AUSTRON INC AUSTIN TEXAS

ASSY. PROCEDURE – BATTERY HOOK-UP

SIZE	CODE IDENT NO	
2	24672	201 97336

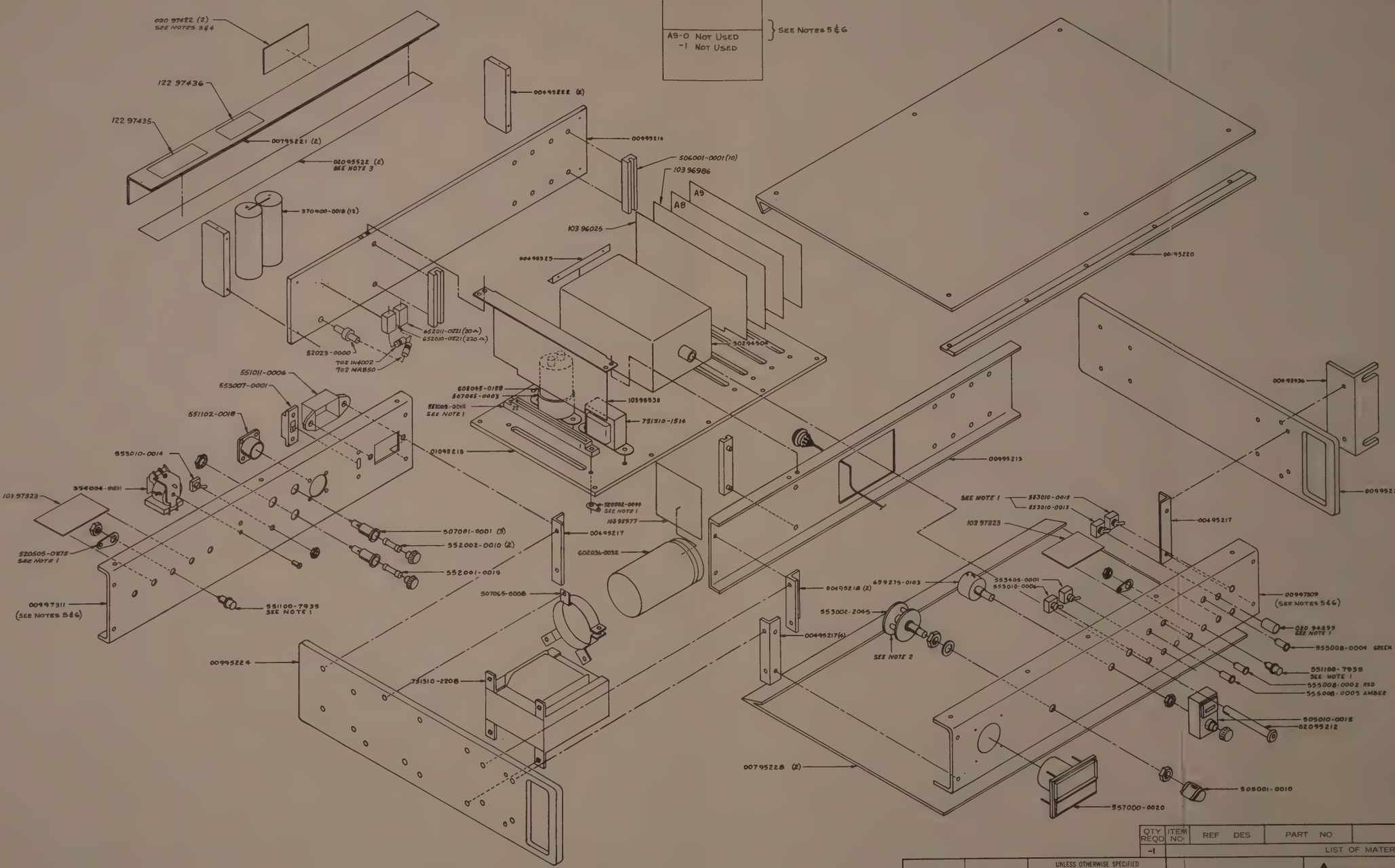
SCALE NONE | SHEET OF

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	RELEASED	1-19-77	R.S.M.

A8-0 NOT USED
-1 103 96986

A9-0 NOT USED
-1 NOT USED

} SEE NOTES 5 & 6



* 6. FOR P/N 254 97307-1 USE FRONT PANEL "009 97309-1; REAR PANEL "009 97311-1; A8 "103 96986; A9 NOT USED.
* 5. FOR P/N 254 97307 USE FRONT PANEL "009 97309; REAR PANEL "009 97311; A8 & A9 NOT USED.
4. MOUNT DIRECTLY BEHIND FUSES ON REAR PANEL.
3. INSULATOR - ATTACH WITH DOUBLE SIDED TAPE.
2. REMOVE BACK WAFER FROM SWITCH AND CUT SHAFT ½" LONG FROM INSIDE FRONT PANEL.
1. USE QUANTITY REQUIRED FROM PARTS LIST.

NOTES:

QTY REQD	ITEM NO.	REF DES	PART NO	NOMENCLATURE	VENDOR
-1				LIST OF MATERIAL	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWINGS
TOLERANCES UNLESS OTHERWISE SPECIFIED
DECIMALS | FRACTIONS | ANGLES
MATERIAL:

304 97306 *	1250 A
NEXT ASSY	USED ON
APPLICATION	

ENGINEER	[illegible]	1-19-77
CHECKED		
DRAFTSMAN	BARKER	1-12-77

AUSTRON INC AUSTIN, TEXAS

FINAL ASSY. - FREQUENCY STANDARD
MODEL 1250 A

SIZE	CODE IDENT NO	
4	24672	254 97307 *

SCALE NONE SHEET OF

5.0 MAINTENANCE

5.1 SCOPE OF SECTION

5.1.1 The maintenance section of this manual provides the technician with a general approach to maintaining the Model 1250A. Included are trouble analysis guides and general maintenance procedures.

5.2 TROUBLE ANALYSIS GUIDES

5.2.1 Specific information is provided in the following:

SYMPTOM	PROBABLE CAUSE
(Line Lamp) 1A1DS1 fails to light	1. AC power not available. 2. Power switch not on. 3. Power cord not connected. 4. 230V selected when on 115V. 5. Lamp burned out.
Charge lamp fails to light (1A1DS2) when line lamp is on	1. Lamp burned out. 2. Switch S3 open.
Standby lamp fails to light (1A1DS3)	1. Lamp burned out. 2. SCR circuit on A2. 3. Relay 1A1K1 bad.

5.2.1 (Cont'd.)

SYMPTOM	PROBABLE CAUSE
Batt circuit test reads high	1. Blown F2. 2. Open S2. 3. Battery pack open.
Reg. circuit test reads high	1. Check Batt. circuit test. 2. Q1 on A2 shorted. 3. K1 on A2 not closed.
Oven circuit test reads low	1. A3 is in warm-up stage. 2. Supply voltage to A3 low. 3. Defective A3.
5 MHz circuit test reads low	1. Check output of A3 with A4 and A5 removed; should be 1V RMS. 2. Check A5 meter circuit.
1 MHz circuit test reads low	1. Check output of A4 with A5 removed; should be 1V RMS. 2. Check A5 meter circuit.
100 kHz circuit test reads low	1. Check output of A4 with A5 removed; should be 1V RMS. 2. Check A5 meter circuit.

5.2.1 (Cont'd.)

SYMPTOM	PROBABLE CAUSE
5 MHz output not present circuit test meter reads OK	1. Check output of A5. 2. Check A6 or A7.
1 MHz output not present circuit test meter reads OK	1. Check output of A5. 2. Check A6 or A7.
100 kHz output not present...circuit test meter reads OK	1. Check output of A5. 2. Check A6 or A7.
Clock output not present	1. Check A4.
Tuning voltage input has no effect	1. Check A2. 2. Defective A3.
A3 has no output	1. Check supply A2. 2. Remove A4 and A5; if still not present A3 is defective.
Cannot adjust coarse frequency	1. Tuning tool broken. 2. Defective A3.
Batteries will not operate unit for 10 hours	1. Not charged for 16 hours. 2. High charging circuit not delivering 300 to 500 mA. 3. Replace batteries.

5.3 GENERAL MAINTENANCE

5.3.1 Check capacity of Nicad batteries every six months. Deep discharge and recharge for 16 hours. When batteries do not give required standby capacity replace them. (See paragraph 1.4.2.)

5.3.2 No other periodic maintenance is required.

6.0 SPECIAL OPTIONS

6.1 SCOPE OF SECTION

6.1.1 This section list the special options and describes the changes to the standard 1250A Frequency Standard for each of these special options.

6.2 LIST OF SPECIAL OPTIONS

Option No.	Description
-01	Separately buffered, dual outputs to the rear of the unit only.

6.3 DESCRIPTION OF CHANGES FOR SPECIAL OPTIONS

6.3.1 Special option -01, separately buffered dual outputs on the rear of the unit only.

6.3.1.1 For this option, the front panel outputs 5 MHz (J3), 1MHz (J4), 100kHz (J5), and output filter (A6) are moved to the rear panel and mounted under the existing matching outputs. A separate output amplifier card (A8) is added for these outputs. Output amplifier (A8) is identical to output amplifier (A5) and these inputs are wired in parallel.

7.0 REPLACEABLE PARTS

7.2 SCOPE OF SECTION

7.1.1 The following is a list of replaceable parts which includes the reference designator, description, and AUSTRON Part Number. For convenience in ordering from local suppliers, the manufacturer's part number and the manufacturer's Federal Identification Code (FIC) are also given where applicable.

7.2 ORDERING REPLACEMENT PARTS

7.2.1 To order replacement parts from AUSTRON, Inc. address order to:

AUSTRON, Inc.
1915 Kramer Lane
Austin, Texas 78758

Specify for each part; 1)model and serial number of the instrument from the rear panel label, 2)complete circuit reference designator, 3)AUSTRON part number, 4)description.

7.2.2 To order parts not listed, add a complete description of function of part and location.

7.2.3 Part numbers as shown will change occasionally as vendor items are re-evaluated or as improved components become available. The equivalent part currently used in production at the time orders are received will be shipped. Where manufacturer's part number or FIC is missing, any reputable manufacturer's part of the appropriate value, indicated in the description, may be used.

7.2.4 The circuit reference designator includes the reference designator prefix in the page heading plus the reference designator for the individual part. If, for example, the reference designator prefix for a circuit board assembly is 1A4A7 and the desired componenet is capacitor C1, the complete circuit reference designator would be 1A4A7C1.

ASSEMBLY FREQ STD 5, 1MHZ&100KHZ W/ET
ASSEMBLY NUMBER 30497306
REFERENCE DESIGNATOR PREFIX
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
	TUNING TOOL	02096081		24672
	PCB ASSY, EXTENDER	10393765		24672
	MANUAL, MODEL 1250A	12797317		24672
1	FINAL ASSY, 5,1MHZ,100KHZ W/ET	25497307		24672
	CLAMP, AN3057-6	551013-0006	AN3057-6	81352
	CONNECTOR, MS3106A-14S-2S	551106-0019	MS3106A-14S-2S	96906
	FUSE 3AG 1 AMP 250V	552001-0019	312001	75915
	FUSE 3AG 1 AMP 250V	552001-0019	312001	75915
	FUSE 3AG 1 AMP 250V	552001-0019	312001	75915
	FUSE 3AG 1 AMP 250V	552001-0019	312001	75915
	FUSE 3AG 1 AMP 250V	552001-0019	312001	75915
	FUSE 3AG 1 AMP 250V SLO BLO	552002-0010	313001	75915
	FUSE 3AG 1 AMP 250V SLO BLO	552002-0010	313001	75915
	FUSE 3AG 1 AMP 250V SLO BLO	552002-0010	313001	75915
	FUSE 3AG 1 AMP 250V SLO BLO	552002-0010	313001	75915
	FUSE 3AG 1 AMP 250V SLO BLO	552002-0010	313001	75915

ASSEMBLY FINAL ASSY, 5,1MHZ,100KHZ W/ET
ASSEMBLY NUMBER 25497307
REFERENCE DESIGNATOR PREFIX 1
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
A1	CHASSIS CKT ASSY 5,1MHZ,100KHZ W/E	20497308		24672
A1A1	PCB ASSY, DIODE BRIDGE	10395977		24672
A1A2	PCB ASSY, POWER SUPPLY	10395533		24672
A1A3	XTLOSC, 1150 (70-85 DEG)	30295838		24672
A1A4	PCB ASSY, SINE CONVERTER	10396025		24672
A1A5	PCB ASSY, OUTPUT AMPLIFIER	10396986		24672
A1A6	PCB ASSY, OUTPUT FILTER	10397323		24672
A1A7	PCB ASSY, OUTPUT FILTER	10397323		24672

ASSEMBLY CHASSIS CKT ASSY 5,1MHZ,100KHZ W/E
ASSEMBLY NUMBER 20497308
REFERENCE DESIGNATOR PREFIX 1A1
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
BT1A	4.OSC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1B	4.OSC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1C	4.OSC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1D	4.OSC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1E	4.OSC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1F	4.OSC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1G	4.OSC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1H	4.OSC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1I	4.OSC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1J	4.OSC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1K	4.OSC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1L	4.OSC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
C1	8400UF 40V 10 CAP POWERLYTIC	602036-0032	36D842G040BB2A	01384
C2	1500UF 25V 10 CAP ELECT	602045-0158	CG152U25A1	90201
C3	.01UF 200V 10 CAP MYLAR	604192-0016	192P10392	56289
C4	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C5	4.7 UF 35V 10 CAP TANT	608017-0475	CS13BF475K	81349
CR1	100PRV1A DIO S RECT DO-41	7011N4002	1N4002	81349
CR2	50VR 3A DIO S RECT	701MR850	MR850	04713
DS1	LAMP, GRN 28V	555008-0004	BP62-GCB-1762	03797
DS2	LAMP, YEL 28V	555008-0005	BP62-ACB-1762	03797
DS3	LAMP, RED 28V	555008-0002	BP62-RCB-1762	03797
F1	FUSE 3AG 1 AMP 250V SLO BLO	552002-0010	313001	75915
F2	FUSE 3AG 1 AMP 250V SLO BLO	552002-0010	313001	75915
F3	FUSE 3AG 1 AMP 250V	552001-0019	312001	75915
J1	CONNECTOR 125V 6A AC	551011-0006	EAC301	82389
J2	CONNECTOR, 4-PIN MS3102A-14S-2P	551102-0018	MS3102A-14S-2P	96906
J3	CONNECTOR BNC	551100-7935	KC79-35	11636
J4	CONNECTOR BNC	551100-7935	KC79-35	11636
J5	CONNECTOR BNC	551100-7935	KC79-35	11636
J6	CONNECTOR BNC	551100-7935	KC79-35	11636
J7	CONNECTOR BNC	551100-7935	KC79-35	11636
J8	CONNECTOR BNC	551100-7935	KC79-35	11636

ASSEMBLY CHASSIS CKT ASSY 5,1MHZ,100KHZ W/E (CONT)
ASSEMBLY NUMBER 20497308
REFERENCE DESIGNATOR PREFIX 1A1
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
J9	CONNECTOR BNC	551100-7935	KC79-35	11636
J10	CONNECTOR BNC	551100-7935	KC79-35	11636
K1	DPDT 10A RELAY KA11DG-24VDC	554004-0011	KA11DG-24	12300
L1	REACTOR, FILTER 10MH	751310-1514	TM-1514	20795
M1	METER, 0-100UA	557000-0020	1S-DUA-100	32171
MP1	CLAMP CAPACITOR	507065-0003	VR3	37942
MP2	CLAMP CAPACITOR	507065-0008	VR8	37942
MP3	KNOB CONTROL	505001-0010	70-5-2G	94144
MP4	DIAL TURNS COUNTING	505010-0015	15-1-11	02111
R1	150 OHM 10 W 3 RES FXD W.W.	652011-0151	RE65G150R	81349
R2	10 OHM 10 W 3 RES FXD W.W.	652011-0100	RE65G10R0	81349
R3	10 K 2 W 5 RES VAR W.W.	659275-0103	534-103	02111
R4	8.45K 1/8W 1 RES FXD FILM	653001-8451	RN55D8451F	81349
R5	825 OHM 1/8W 1 RES FXD FILM	653001-8250	RN55D8250F	81349
R6	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349
S1	SWITCH, DPDT 115/230V SLIDE	553007-0001	46256LFR	82389
S2	SWITCH, TOGGLE	553010-0014	MST305D	96906
S3	SWITCH TOGGLE DPDT	553010-0006	MST205N	95146
S4	DPDT MOMENTARY SWT TOGGLE	553405-0001	JMT-226	31356
S5	SWITCH ROTARY	553002-2043	PA-2043	71590
T1	TRANSFORMER PWR	751310-2208	TM-2208	20795
W1	POWER CORD, (SPECIAL-RIGHT ANGLE)	570076-0003	8120-1521	28480
XA2	CONN 22PIN SINGLE READOUT SOL TAB	551009-0016	50-22A-20	71785
XA3	SOCKET 9 PIN MIN	551005-0004	9EM	71785
XA4	CONN 22PIN SINGLE READOUT SOL TAB	551009-0016	50-22A-20	71785
XA5	CONN 22PIN SINGLE READOUT SOL TAB	551009-0016	50-22A-20	71785
XF1	HOLDER,FUSE	507003-2012	342012	75915
XF2	HOLDER,FUSE	507003-2012	342012	75915
XF3	HOLDER,FUSE	507003-2012	342012	75915

ASSEMBLY PCB ASSY, DIODE BRIDGE
ASSEMBLY NUMBER 10395977
REFERENCE DESIGNATOR PREFIX 1A1A1
QUANTITY 1 EA

REF DES	PART DESCRIPTION		AUSTRON PART	MFG PART	FIC
CR1	600PRV1A	DIO S RECT DO-41	7011N4005	1N4005	81349
CR2	600PRV1A	DIO S RECT DO-41	7011N4005	1N4005	81349
CR3	600PRV1A	DIO S RECT DO-41	7011N4005	1N4005	81349
CR4	600PRV1A	DIO S RECT DO-41	7011N4005	1N4005	81349

ASSEMBLY PCB ASSY, POWER SUPPLY
ASSEMBLY NUMBER 10395533
REFERENCE DESIGNATOR PREFIX 1A1A2
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	.1UF 100V 10 CAP DIP MICA	606030-0104	1DP2-104	84171
C2	4.7 UF 35V 10 CAP TANT	608017-0475	CS13BF475K	81349
CR1	100PRV1A DIO S RECT DO-41	7011N4002	1N4002	81349
CR2	NOT USED			
CR3	9.1 V 400MW 5 DIO S ZEN DO-7	7011N960B	1N960B	81349
CR4	SCR	702C103YY	C103YY	03508
K1	WJS-6D 2.8MA RELAY	554201-0001	WJS6D	02288
MP1	HEATSINK, PCB	02096034		24672
MP2	BRACKETS, ANGLE	501000-6261	246	79963
MP3	BRACKETS, ANGLE	501000-6261	246	79963
MP4	PAD, TSTR MTG, TO-5 CAN	520641-0001	7717-3N	13103
Q1	TRANSISTOR	702MJE3055	MJE3055	04713
Q2	0.8 W TO-5 XSTR NPNS SH	7022N2218	2N2218	81349
R1	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R2	2 K 0.75W10 RES VAR CERMET	659012-0202	78PR2K	06110
R3	6.8 K 1/4W 10 RES FXD COMP	651102-0682	RC07GF682K	81349
R4	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R5	1.5 K 1/4W 10 RES FXD COMP	651102-0152	RC07GF152K	81349
R6	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R7	4.75K 1/8W 1 RES FXD FILM	653001-4751	RN55D4751F	81349
R8	10 K 1/8W 1 RES FXD FILM	653001-1002	RN55D1002F	81349
R9	47.5K 1/8W 1 RES FXD FILM	653001-4752	RN55D4752F	81349
R10	150 K 1/8W 1 RES FXD FILM	653001-1503	RN55D1503F	81349
R11	301 K 1/8W 1 RES FXD FILM	653001-3013	RN55D3013F	81349

ASSEMBLY XTLOSC, 1150 (70-85 DEG)
ASSEMBLY NUMBER 30295838
REFERENCE DESIGNATOR PREFIX 1A1A3
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
	THIS UNIT IS SEALED AND AS SUCH IS NOT FIELD REPAIRABLE. RETURN TO FACTORY FOR REPAIR OR REPLACEMENT.			

ASSEMBLY PCB ASSY, SINE CONVERTER
ASSEMBLY NUMBER 10396025
REFERENCE DESIGNATOR PREFIX 1A1A4
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C2	33 UF 6V 10 CAP TANT	608014-0336	CS13BC336K	81349
C3	33 UF 6V 10 CAP TANT	608014-0336	CS13BC336K	81349
C4	33 UF 6V 10 CAP TANT	608014-0336	CS13BC336K	81349
C5	4700 PF 500V 5 CAP DIP MICA	603000-0472	CM06FD472J03	81349
C6	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C7	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C8	3300 PF 500V 5 CAP DIP MICA	603000-0332	CM06FD332J03	81349
C9	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C10	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C11	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C12	.018 UF 50V 10 CAP FILM	607050-0183	65F11AA183	01002
L1	CHOKE, WIDEBAND	751102-0000	VK20010/3B	02114
Q1	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q2	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q3	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q4	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
R1	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R2	10 K 1/4W 10 RES FXD COMP	651102-0103	RC07GF103K	81349
R3	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R4	10 K 1/4W 10 RES FXD COMP	651102-0103	RC07GF103K	81349
R5	2.2 K 1/4W 10 RES FXD COMP	651102-0222	RC07GF222K	81349
R6	SELECTED			
R7	SELECTED			
R8	470 OHM 1/4W 10 RES FXD COMP	651102-0471	RC07GF471K	81349
R9	470 OHM 1/4W 10 RES FXD COMP	651102-0471	RC07GF471K	81349
R10	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349
R11	100 OHM 1/4W 10 RES FXD COMP	651102-0101	RC07GF101K	81349
R12	100 OHM 1/4W 10 RES FXD COMP	651102-0101	RC07GF101K	81349
R13	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349
R14	47 OHM 1/8W 10 RES FXD COMP	651110-0470	RC05GF470K	81349
R15	100 OHM 1/4W 10 RES FXD COMP	651102-0101	RC07GF101K	81349
R16	33 OHM 1/4W 10 RES FXD COMP	651102-0330	RC07GF330K	81349

ASSEMBLY PCB ASSY, SINE CONVERTER (CONT)
ASSEMBLY NUMBER 10396025
REFERENCE DESIGNATOR PREFIX 1A1A4
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
R17	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349
R18	100 OHM 1/4W 10 RES FXD COMP	651102-0101	RC07GF101K	81349
R19	47 OHM 1/8W 10 RES FXD COMP	651110-0470	RC05GF470K	81349
T1	XFORMER, 1MHZ OUTPUT	75195770		24672
T2	TRANSFORMER 100 KHZ	75196926		24672
U1	IC QUADR 2-INP NAND GATE	703SN54LS00J	SN54LS00J	01295
U2	IC DECADE COUNTER	703SN54LS90J	SN54LS90J	01295
U3	IC DECADE COUNTER	703SN54LS90J	SN54LS90J	01295

ASSEMBLY PCB ASSY, OUTPUT AMPLIFIER
ASSEMBLY NUMBER 10396986
REFERENCE DESIGNATOR PREFIX 1A1A5
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C2	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C3	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C4	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C5	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C6	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C7	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C8	3300 PF 500V 5 CAP DIP MICA	603000-0332	CM06FD332J03	81349
C9	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C10	3300 PF 500V 5 CAP DIP MICA	603000-0332	CM06FD332J03	81349
C11	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C12	.018 UF 50V 10 CAP FILM	607050-0183	65F11AA183	01002
CR1	PRV75 DIO S SIG	7011N914	1N914	81349
CR2	PRV75 DIO S SIG	7011N914	1N914	81349
CR3	PRV75 DIO S SIG	7011N914	1N914	81349
L1	CHOKE 470UH	751104-0471	MS90537-45	96906
L2	CHOKE 2200UH	751104-0222	MS90537-53	96906
L3	CHOKE 27000UH	751104-0273	MS90537-65	96906
Q1	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q2	0.31W TO-92 XSTR PNPS SH	7022N3906	2N3906	81349
Q3	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q4	0.31W TO-92 XSTR PNPS SH	7022N3906	2N3906	81349
Q5	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q6	0.31W TO-92 XSTR PNPS SH	7022N3906	2N3906	81349
R1	SELECTED			
R2	470 OHM 1/4W 10 RES FXD COMP	651102-0471	RC07GF471K	81349
R3	15 K 1/4W 10 RES FXD COMP	651102-0153	RC07GF153K	81349
R4	1.5 K 1/4W 10 RES FXD COMP	651102-0152	RC07GF152K	81349
R5	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R6	220 OHM 1/4W 10 RES FXD COMP	651102-0221	RC07GF221K	81349
R7	SELECTED			
R8	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349
R9	68 OHM 1/4W 10 RES FXD COMP	651102-0680	RC07GF680K	81349

ASSEMBLY PCB ASSY, OUTPUT AMPLIFIER (CONT)
ASSEMBLY NUMBER 10396986
REFERENCE DESIGNATOR PREFIX 1A1A5
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
R10	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349
R11	470 OHM 1/4W 10 RES FXD COMP	651102-0471	RC07GF471K	81349
R12	15 K 1/4W 10 RES FXD COMP	651102-0153	RC07GF153K	81349
R13	1.5 K 1/4W 10 RES FXD COMP	651102-0152	RC07GF152K	81349
R14	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R15	220 OHM 1/4W 10 RES FXD COMP	651102-0221	RC07GF221K	81349
R16	SELECTED			
R17	68 OHM 1/4W 10 RES FXD COMP	651102-0680	RC07GF680K	81349
R18	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349
R19	SELECTED			
R20	NOT USED			
R21	15 K 1/4W 10 RES FXD COMP	651102-0153	RC07GF153K	81349
R22	1.5 K 1/4W 10 RES FXD COMP	651102-0152	RC07GF152K	81349
R23	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R24	220 OHM 1/4W 10 RES FXD COMP	651102-0221	RC07GF221K	81349
R25	SELECTED			
R26	100 OHM 1/4W 10 RES FXD COMP	651102-0101	RC07GF101K	81349
R27	150 OHM 1/4W 10 RES FXD COMP	651102-0151	RC07GF151K	81349
T1	XFORMER, 5MHZ OUTPUT	75195768		24672
T2	XFORMER, 1MHZ OUTPUT	75195770		24672
T3	TRANSFORMER 100 KHZ	75196926		24672
Y1	CRYSTAL, 5MHZ FILTER	752B5000000	4051122-C	74306
Y2	CRYSTAL, 1MHZ FILTER	752A1000000	4051122	74306

ASSEMBLY PCB ASSY, OUTPUT FILTER
ASSEMBLY NUMBER 10397323
REFERENCE DESIGNATOR PREFIX 1A1A6
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	2200 PF 500V 5 CAP DIP MICA	603000-0222	CM06FD222J03	81349
C2	1000 PF 500V 5 CAP DIP MICA	603000-0102	CM06FD102J03	81349
C3	.018 UF 50V 10 CAP FILM	607050-0183	65F11AA183	01002
L1	5MHZ FILTER INDUCTOR 4.6UH	75197469		24672
L2	1MHZ FILTER INDUCTOR 25UH	75197468		24672
L3	INDUCTOR, 100KHZ FILTER	75197467		24672

ASSEMBLY PCB ASSY, OUTPUT FILTER
ASSEMBLY NUMBER 10397323
REFERENCE DESIGNATOR PREFIX 1A1A7
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	2200 PF 500V 5 CAP DIP MICA	603000-0222	CM06FD222J03	81349
C2	1000 PF 500V 5 CAP DIP MICA	603000-0102	CM06FD102J03	81349
C3	.018 UF 50V 10 CAP FILM	607050-0183	65F11AA183	01002
L1	5MHZ FILTER INDUCTOR 4.6UH	75197469		24672
L2	1MHZ FILTER INDUCTOR 25UH	75197468		24672
L3	INDUCTOR, 100KHZ FILTER	75197467		24672